

What is claimed is:

1. A method of forming a structure wherein an electrode comprising a refractory
5 metal is deposited, the method comprising:
 providing a substrate;
 depositing at least a first, a second and a third electron sensitive resist layers over
the substrate, the first electron sensitive resist layer being disposed closer to said substrate
than are said second and third electron sensitive resist layers, the second electron
10 sensitive resist layer being disposed closer to said substrate than is said third electron
sensitive resist layer;
 forming a mold in at least the first, second and third electron sensitive resist
layers; and
 evaporating the refractory metal in the mold, wherein at least the first and third
15 electron sensitive resist layers in the plurality of electron sensitive resist layers maintain
their shape during the step of evaporating the refractory metal in the mold.
2. The method of claim 1, wherein the forming of the mold includes exposing the
first, second and third electron sensitive resist layers to an electron beam, thereby
20 defining exposed regions in the first, second and third electron sensitive resist layers.
3. The method of claim 2, further comprising developing the exposed regions in the
first, second and third electron sensitive resist layers, thereby removing the exposed
regions from the first, second and third electron sensitive resist layers and thereby
25 creating the mold.
4. The method of claim 3, wherein the first and third electron sensitive resist layers
are less sensitive to the electron beam than is the second electron sensitive resist layer.
- 30 5. The method of claim 4, wherein the middle electron sensitive resist layer has a
viscosity that allows the second electron sensitive resist layer to be at least 7000Å thick.

6. The method of claim 1, wherein the refractory metal is selected from a member of the group consisting of tungsten and molybdenum.
- 5 7. The method of claim 1, wherein the plurality of electron sensitive resist layers are exposed to temperatures up to approximately 180 °C during the evaporation of the refractory metal.
8. The method of claim 1 wherein the electrode is a gate electrode.
- 10 9. The method of claim 8, further comprising depositing a high electrical conductivity metal gate contact over the refractory metal, thereby forming the gate electrode.
- 15 10. The method of claim 1, wherein the mold defines a mushroom shape.
11. The method of claim 10, further comprising the step of lifting off the plurality of electron sensitive resist layers after the step of depositing the gate contact.
- 20 12. A method of forming a structure wherein an electrode comprising a refractory metal is deposited, the method comprising the steps of:
- providing a substrate having a plurality of alignment markers;
 - depositing a first, a second and a third electron sensitive resist layer over the substrate and the alignment markers;
 - 25 removing the portions of the plurality of electron sensitive resist layers above and around the alignment markers;
 - forming a mold in the plurality of electron sensitive resist layers using the alignment markers as reference points; and
 - evaporating the refractory metal in the mold, the first and third electron sensitive
 - 30 resist maintaining their respective shapes during evaporation of the refractory metal.

13. The method of claim 12, wherein forming of the mold includes exposing the first, second and third electron sensitive resist layers to an electron beam, thereby defining exposed regions in the first, second and third electron sensitive resist layers.

5 14. The method of claim 13, further comprising developing the exposed regions in the first, second and third electron sensitive resist layers, thereby removing the exposed regions from the first, second and third electron sensitive resist layers and thereby creating the mold.

10 15. The method of claim 14, wherein the first electron sensitive resist layer is located nearer the substrate than are either the second or third electron sensitive resist layers and the third electron sensitive resist is located further from the substrate than are either the first or second electron sensitive resist layers.

15 16. The method of claim 18, wherein the first and third electron sensitive resist layers are each less sensitive to the electron beam than is the second electron sensitive resist layer.

17. The method of claim 16, wherein the second electron sensitive resist layer has a
20 viscosity that allows the middle electron sensitive resist layer to be at least 7000Å thick.

18. The method of claim 12, wherein the refractory metal is selected from a member of the group consisting of tungsten and molybdenum.

25 19. The method of claim 12, wherein the plurality of electron sensitive resist layers are exposed to temperatures up to 180 °C during evaporation of the refractory metal.

20. The method of claim 12, further comprising depositing a high electrical conductivity metal gate contact over the refractory metal, thereby forming a gate
30 electrode.

21. The method of claim 20, further comprising lifting off the first, second and third electron sensitive resist layers after the gate contact has been deposited.

22. The method of claim 12, wherein the mold defines a mushroom shape.

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23. The method of claim 12, wherein the alignment markers comprise an ohmic metal.

24. A method of forming a structure wherein an electrode including a refractory metal is formed, the method comprising:

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providing a substrate;

depositing a plurality of electron sensitive resist layers on the substrate, the plurality of electron sensitive resist layers comprising an electron sensitive resist layer nearest the substrate, an electron sensitive resist layer farthest from the substrate, and a intermediate electron sensitive resist layer formed between the electron sensitive resist layer nearest the substrate and the electron sensitive resist layer farthest from the substrate;

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forming a mold in at least the intermediate electron sensitive resist layer and in at least the electron sensitive resist layer nearest the substrate, the mold defining a mushroom shape; and

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evaporating the refractory metal in the mold, wherein the electron sensitive resist layer nearest the substrate and the electron sensitive resist layer farthest from the substrate maintain there shape during the evaporation of the refractory metal.

25. The method of claim 24, wherein formation of the mold includes exposing the plurality of electron sensitive resist layers to an electron beam, thereby defining exposed regions in the plurality of electron sensitive resist layers.

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26. The method of claim 25, further comprising developing the exposed regions in the plurality of electron sensitive resist layers, thereby removing the exposed regions from the plurality of electron sensitive resist layers and thereby creating the mold.

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27. The method of claim 26, wherein the electron sensitive resist layer in the two electron sensitive resist layers nearest the substrate is less sensitive to the electron beam than the intermediate electron sensitive resist layer.

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28. The method of claim 27, wherein the intermediate electron sensitive resist layer has a viscosity which allows the intermediate electron sensitive resist layer to be at least 7000 Å thick.

10 29. The method of claim 24, wherein the refractory metal is selected from a member of the group consisting of tungsten and molybdenum.

15 30. The method of claim 24, wherein the plurality of electron sensitive resist layers are exposed to temperatures up to 180 °C during the step of evaporating a refractory metal.

31. The method of claim 24, further comprising depositing a gate contact over the refractory metal, thereby forming a gate.

20 32. The method of claim 31, further comprising lifting off the plurality of electron sensitive resist layers after the depositing the gate contact.